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CHANGES IN THE URINE SUBSEQUENT TO NEPHRECTOMY—TWO CASES.

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CHANGES IN THE URINE SUBSEQUENT TO NEPHRECTOMY—TWO CASES.

THE published records of the changes in the urine following nephrectomy are very scant and very incomplete; hence it is thought the following report will be of some general interest. In each of the cases here reported Dr. Dudley P. Allen, of this city, was the operating surgeon, and it was through his kindness that the writer was enabled to make the extended observations recorded in the subjoined tables. In the first case, one of floating kidney with calculi, the observations were, unfortunately, not begun until a week after the operation. The second case was one of sinus following nephrotomy, and the observations began upon the day of operation. The following tables present the result of the examinations of the urine from day to day, in each case for a period of nearly six weeks after the operation.

TABLE I.

The results of the daily examination of the urine of Case I.

Date.	Total urine.	Specific gravity.	Solids.	Reaction.	Urea in 1 c.c.	Urea in 24 hours.	Ratio of urea to solids.	Indican.	Clinical notes.
Nov. 7	c.c.	gm.	gm.	Alkaline.	0.019	14.27			Headache.
8	746	.....	.....	Neutral.	0.013	15.13			"
9	1195	.....	.....	Alkaline.	0.0215	13.87			
10	645	.....	.....	Neutral.	0.0175	16.71			
11	955	.....	.....	Alkaline.	0.0115	17.25			
12	1230	.....	.....	Neutral.	0.010	15.60			
13	1310	.....	.....	Alkaline.	0.0235	13.16	1:1.9		
14	560	1020	25.10	Acid.	0.0105	17.64			
15	1680	.....	.....	"	0.0145	17.40	1:2.7		
16	1200	1017	47.53	"	0.019	19.00	1:2.1	Slight.	
17	1000	1017	39.61	"	0.012	16.92	1:1.6	"	
18	1410	1008	26.28	"	0.0165	18.15	1:2.4	"	
19	1100	1017	43.56	"	0.013	15.02	1:2.2	Increased.	
20	1155	1012	32.29	"	0.011	14.63	1:2.5	"	
21	1330	1012	37.19	"	0.011	15.13	1:5.3	Headache.	
22	900	1020	41.94	Alkaline.	0.011	11.70	1:3.6	Slight.	"
23	1160	1015	40.54	"	0.013	12.76	1:3.2	Gt. incr.	
24	470	1025	27.38	Acid.	0.027	12.69	1:2.2	Increased.	Slight fever.
25	485	1026	29.33	"	0.0275	13.34	1:2.2	Gt. incr.	" "
26	585	1022	29.99	Alkaline.	0.0225	13.16	1:2.3	Slight.	" "
27	575	1026	34.83	Acid.	0.0255	14.66	1:2.4	"	" "
28	775	1022	39.73	"	0.017	13.18	1:3.0	"	" "
29	575	1019	25.46	"	0.0155	8.91	1:2.9	"	" "
30	725	1020	33.79	"	0.016	11.60	1:2.9	"	" "
Dec. 1	900	1018	37.75	"	0.018	16.20	1:2.3		
2	1055	1018	44.25	"	0.016	16.88	1:2.6		
3	1475	1018	51.55	"	0.010	14.75	1:3.5		
4	1375	1014	44.90	"	0.012	16.50	1:2.7		
5	1100	1017	43.57	"	0.012	13.20	1:3.3		
6	425	1018	22.02	"	0.021	8.93	1:2.5		
7	455	1019	20.14	"	0.024	10.92	1:1.8		
8	320	1025	18.64	"	0.023	7.36	1:2.5		
9	515	1020	24.00	Alkaline.	0.017	8.72	1:2.8	Very poorly.	
10	840	1014	28.50	Acid.	0.012	10.08	1:2.8	Quite ill.	
11	1050	1014	34.25	"	0.011	11.55	1:2.9		
12	1065	1013	32.26	"	0.013	13.85	1:2.3		
13	810	1017	32.08	"	0.014	11.34	1:2.9		
14	800	1015	27.96	"	0.0145	11.60	1:2.4		
15	1100	1010	25.63	"	0.0115	12.65	1:2.0		
16	720	1018	30.20	"	0.0175	12.60	1:2.4		Patient went home.
	1450	1013	43.90	"	0.010	14.50	1:3.0		Urine of February 27, 1893.



TABLE II.

Result of the daily examination of the urine of Case II.

Date.	Total urine.	Specific gravity.	Solids.	Reaction.	Urea in 1 c.c.	Urea in 24 hours.	Ratio of urea to solids.	Indican.	Clinical notes.
Jan.	c.c.	gm.			gm.	gm.			
19	600	1030	41.94	Acid, highly.	0.026	15.00	1:2.7	Considerable.	
20	440+	1030	30.76	"	0.032	14.08	1:2.2	Great excess.	
21	535+	1027	33.66	"	0.039	20.87	1:1.6	"	
22	625	1025	36.41	"	0.0295	18.44	1:2.0	Slight decr.	
23	540+	1033	41.52	Alkaline.	0.0245	13.23	1:3.1	Decreased.	Temperature rose to 101°.
24	950	1016	34.82	Acid.	0.0155	14.73	1:2.4	"	Temperature rose to 102°.
25	1140	1015	39.84	"	0.014	15.96	1:2.5	Slight.	
26	930	1018	39.00	"	0.0165	15.35	1:2.5	Increased.	Temperature rose a little.
27	1400	1015	48.93	"	0.014	19.60	1:2.5	Slight.	
28	1000	1018	41.94	"	0.018	18.00	1:2.3	"	
29	1600	1015	55.82	"	0.016	25.60	1:2.1	"	
30	Absent.								Considerable fever.
31	1600	1013	48.46	Acid.	0.0165	26.40	1:1.8	Slight.	Considerable fever.
Feb.									
1	1100	1011	28.19	"	0.0135	14.85	1:1.9		
2	1200	1015	41.94	"	0.0165	19.80	1:2.1		
3	1800	1012	50.33	"	0.0105	18.90	1:2.7		
4	1000	1020	46.60	"	0.014	14.00	1:3.3		
5	1300	1016	48.46	"	0.015	19.50	1:2.5		
6	1600	1013	48.46	"	0.012	19.20	1:2.5		
7	1350	1013	40.79	"	0.013	17.55	1:2.3		
8	1450	1015	50.68	"	0.012	17.40	1:2.9		
9	1400	1013	45.67	"	0.010	14.00	1:3.3		
10	900	1015	31.46	"	0.0135	12.15	1:2.6		
11	950	1012	26.56	"	0.013	12.35	1:2.2		
12	800	1022	41.00	"	0.023	18.40	1:2.2		
13	1400	1015	48.93	"	0.0105	14.70	1:3.4		
14	1150	1014	37.51	"	0.014	16.00	1:2.3		
15	900	1018	37.75	"	0.0175	15.75	1:2.4		
16	1300	1012	36.85	"	0.011	14.30	1:2.6		
17	1250	1013	37.86	"	0.011	13.75	1:2.8		
18	1275	1015	44.46	"	0.011	14.08	1:3.2		
19	1050	1019	44.04	"	0.0135	14.18	1:3.1		
20	1000	1018	41.94	"	0.015	15.00	1:2.8		
21	950	1013	28.78	"	0.013	12.35	1:2.3		
22	1100								
23	170+	1018	71.30	Alkaline.	0.0125	21.35	1:3.4		
24	1500	1018	62.91	"	0.014	21.00	1:3.0		
25	1000	1017	39.61	"	0.015	15.00	1:2.6		
26	1200	1018	50.33	"	0.014	16.80	1:3.0		
27	1300	1016	48.46	Acid.	0.014	18.20	1:2.7		
28	1000	1020	46.60	"	0.0175	17.50	1:2.7		

TABLE III.

Weekly averages of quantity, solids, and urea (of Case I.), deduced from Table I.

	Week.	Urine.	Solids.	Urea.	Ratio of urea to solids.
November	7-13.....	c.c.	gm.	gm.	
"	14-20.....	949	.....	15.14	
"	21-27.....	1268	37.78	17.25	1:2.7
"	28-December 4.....	793	47.70	12.35	1:3.0
December	5-11.....	983	45.32	14.00	1:2.8
"	12-16.....	684	27.30	10.10	1:2.4
		919	29.63	12.41	1:2.4

TABLE IV.

Total averages of quantity, solids, and urea at the end of each week (of Case I.), deduced from Table III.

Date.	Urine.	Solids.	Urea.	Ratio of urea to solids.
	c.c.	gm.	gm.	
November 13.....	949	.....	15.14	
“ 20.....	1108	37.78	16.19	1 : 2.7
“ 27.....	1003	42.74	15.25	1 : 2.9
December 4.....	993	44.03	14.62	1 : 2.9
“ 11.....	889	35.66	12.36	1 : 2.7
“ 16.....	879	32.65	12.39	1 : 2.6

TABLE V.

Weekly averages of quantity, solids, and urea (of Case II.), deduced from Table II.

Week.	Urine.	Solids.	Urea.	Ratio of urea to solids.
	c.c.	gm.	gm.	
January 19-25.....	690	36.99	16.03	1 : 2.3
“ 26-February 1.....	1271	43.72	19.98	1 : 2.2
February 2-8.....	1385	50.77	18.05	1 : 3.1
“ 9-15.....	1071	38.41	14.76	1 : 2.6
“ 16-22.....	1275	38.91	14.44	1 : 2.7
“ 23-28.....	1283	53.20	18.29	1 : 2.9

TABLE VI.

Total averages of quantity, solids, and urea at the end of each week (of Case II.), deduced from Table V.

Date.	Urine.	Solids.	Urea.	Ratio of urea to solids.
	c.c.	gm.	gm.	
January 25.....	690	36.99	16.03	1 : 2.3
February 1.....	981	40.36	18.00	1 : 2.2
“ 8.....	1183	45.56	18.03	1 : 2.5
“ 15.....	1127	41.99	16.40	1 : 2.6
“ 22.....	1201	40.45	15.42	1 : 2.8
“ 28.....	1242	46.83	16.86	1 : 2.9

It is unsafe to generalize from two cases, and the writer has been unable to find any record of similar analyses, hence only a few brief comments upon these tables will be made. It seems entirely probable that in all cases of long-standing disease of one kidney, as were the two here reported, the removal of the diseased organ must free the remaining one from the strain of eliminating the poisons absorbed from its neighbor, and that there should be a better performance of natural function by the remaining organ after

nephrectomy. An hyperæmia of the single organ is said to always follow a nephrectomy, but why this should be, in the face of the presumption just stated, is difficult to see, especially in view of the fact that the organ has had months of training for the extra burden, during the time that its fellow was doing a continually decreasing proportion of excretory work. Nevertheless the tables would seem to distinctly indicate such an hyperæmia in each of these cases, in that the maximum daily quantities of solids and urea were produced in the second, third, and fourth weeks after the operation.

In the first case a period when the urine was alkaline occurred in connection with a protracted and severe headache at about the same time as noted by Graves¹ in his cases. The only period of alkaline urine in the second case occurred in the sixth week.

In both cases the maximum daily average of quantity excreted occurred in the third week.

It will be seen that the maximum daily amount of solids was reached in the fourth week of the first case and third week of the second, the maximum in the sixth week of the latter case merely indicating the re-establishment of normal diet and function.

The maximum of urea will be found in the third week of the first case and second week of the second case. In each case the urea reached its maximum one week before the total solids attained a maximum,—an interesting fact but difficult of explanation.

In both cases pus and epithelial cells occurred in considerable amounts for the first week and continued in gradually decreasing amount. In Case II., during the second and third weeks the urine contained blood in sufficient quantity to color it very markedly.

Both patients recovered completely and are now in excellent health.

¹ Two cases of nephrectomy reported by S. C. Graves, of Grand Rapids. Medical News, vol. lxi. pp. 349 and 612.

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